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Fredrik Alfried FORTIER

Attorney Docket No. 01002.0020

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**ANNEXES TO THE  
PRELIMINARY EXAMINATION REPORT  
(ARTICLE 34 AMENDMENTS)**

**Commissioner of Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450**

Sir:

**REQUEST FOR SUBSTITUTION OF REPLACEMENT SHEETS**

Please substitute the attached (5) replacement sheets 19, 20, 21, 22, and 23, of the claims containing the Article 34 Amendments for sheets 19, 20, 21, 22, 23, and 24 of the claims in the enclosed copy of the as-filed PCT application. These claims have been replaced by new claims 30-54 in the enclosed Preliminary Amendment. Claims 30-54 are currently pending.

Respectfully submitted,

FINNEGAN, HENDERSON, FARBOW,  
GARRETT & DINNER, L.L.P.

Dated: February 15, 2006

By: 

Ernest F. Chapman  
Reg. No. 25,961

Enclosures  
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## CLAIMS

1. A support arrangement characterised in that it includes  
a vessel in the form of a core barrel (14) of a high temperature gas cooled reactor (10, 200) which is housed within a reactor pressure vessel (12), the core barrel (14) being generally cylindrical in shape and having an axis which extends generally vertically;  
a single vertical support (16) for supporting the weight of the core barrel (14), the vertical support (16) including upper and lower support members (44, 46) which are connected respectively to the core barrel (14) and the reactor pressure vessel (12) between which the vertical loads are transmitted, the upper and lower support members (44, 46) which are relatively displaceable defining oppositely disposed contact surfaces (50, 60) which are centrally positioned about the axis; and  
lateral support means (18) for providing support to the core barrel (14), the lateral support means including a plurality of circumferentially spaced upper lateral supports (76) each of which includes a set of inner and outer lateral support members (78, 80) connected to the core barrel (14) and the reactor pressure vessel (12), respectively, and a roller element (86) sandwiched between the inner and outer upper lateral support members (78, 80).
2. A support arrangement as claimed in claim 1, in which at least one of the contact surfaces is curved (50, 60).
3. A support arrangement as claimed in claim 2, in which both of the contact surfaces (50, 60) are curved.
4. A support arrangement as claimed in claim 3, in which the upper support member (44) defines a concave contact surface (50), the lower support member (46) defining an oppositely disposed convex contact surface (60).

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5. A support arrangement as claimed in claim 4, in which the radius of the convex contact surface (60) is smaller than that of the concave contact surface (50).
6. A support arrangement as claimed in claim 1, in which the vertical support (16) includes an intermediate member (202) interposed between the upper and lower support members (44, 46).
7. A support member as claimed in claim 6, in which the intermediate member (202) defines upper and lower contact surfaces (204, 206) which cooperate, respectively, with complementary contact surfaces (208, 210) of the upper and lower support members (44, 46).
8. A support arrangement as claimed in claim 7, in which the contact surfaces (204, 206) of the intermediate member (202) are convex with the complementary contact surfaces (208, 210) of the upper and lower support members (44, 46) being concave.
9. A support arrangement as claimed in claim 8, in which each convex contact surface (204, 206) has a radius which is smaller than that of the complementary concave contact surface (208, 210).
10. A support arrangement as claimed in any one of the preceding claims, in which the upper lateral supports (76) are positioned to support the core barrel (14) laterally at or towards the upper end thereof.
11. A support arrangement as claimed in any one of the preceding claims, in which the roller (86) includes at least one gear wheel (92) having teeth, and at least one of the inner and outer upper lateral support members (78, 80) is provided with teeth (98) which are complementary to those on the gear wheel (92) to ensure that relative displacement between the roller (86) and complementary bearing surfaces (82, 84) of the inner and outer upper lateral support members (78, 80) is by rolling.

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12. A support arrangement as claimed in claim 11, in which the bearing surfaces (82, 84) of the inner and outer upper lateral support members (78, 80) are inclined.

13. A support arrangement as claimed in any one of the preceding claims, in which at least one of the inner and outer upper lateral support members (78, 80) of each set is mounted on a resiliently deformable support (104).

14. A support arrangement as claimed in claim 13, in which each outer upper lateral support member (80) is mounted on a resiliently deformable support (104) which, in turn, is mounted on an upper support ring (72) secured to the reactor pressure vessel (12).

15. A support arrangement as claimed in claim 14, in which the resiliently deformable support (104) includes a pair of support posts (106) connected to the upper support ring (72) at spaced apart positions and an elastically deformable guide beam (108) which extends between the support posts (106) and on which the outer upper lateral support member (80) is mounted.

16. A support arrangement as claimed in claim 15, in which the position of the guide beam (108) is adjustable thereby permitting the relative positions of the inner and outer upper lateral support members (78, 80) to be adjusted.

17. A support arrangement as claimed in any one of the preceding claims, in which the lateral support means (18) includes a plurality of circumferentially spaced lower lateral supports (312) positioned to provide lateral support to the core barrel (14) adjacent to a lower end thereof.

18. A support arrangement as claimed in claim 17, in which each lower lateral support includes an elastically deformable locating element (312) extending radially between inner and outer receiving formations (314, 316) to transmit lateral loads between the core barrel (14) and the reactor pressure vessel (12).

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19. A support arrangement as claimed in claim 18, in which the inner receiving formations (314) are provided on the upper support member (44) and the outer receiving formations (316) are protrusions (304, 318) which protrude radially inwardly from a lower support ring (134) secured to the reactor pressure vessel (12).

20. A support arrangement as claimed in any one of the preceding claims, which includes auxiliary support means (130, 132) for providing support to the core barrel (14) within the reactor pressure vessel when subjected to loads in excess of normal operational loads such as would be experienced during a seismic event.

21. A support arrangement as claimed in claim 20, in which the upper support member (44) includes a central member (48) which extends downwardly from the bottom (30) of the core barrel (14) and a plurality of angularly spaced support beams (54) connected to the bottom (30) of the core barrel (14) and to the central member (48) and extending radially outwardly from the central member (48), the auxiliary support means including a lower auxiliary support (130) including a plurality of circumferentially spaced radially inwardly facing slots (138) in which radially outer ends of the support beams (54) are receivable with clearance.

22. A support arrangement as claimed in claim 21, in which the slots (138) are defined on a radially inner surface of a lower support ring (134) secured to the reactor pressure vessel (12).

23. A support arrangement as claimed in claim 20, in which the upper support member (44) includes a central member (48) which extends downwardly from a bottom (30) of the core barrel (14) and a plurality of angularly spaced support beams (54) connected to the bottom (30) of the core barrel (14) and to the central member (48) and extending radially outwardly from the central member (48) to an annular skirt (302) which depends from the core barrel (14), the auxiliary support means including a lower auxiliary support (130) which includes a plurality of circumferentially spaced protrusions

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(304) which protrude radially inwardly from a lower support ring (134) secured to the reactor pressure vessel and which are received with clearance in complementary slots (306) in the skirt (302).

24. A support arrangement as claimed in any one of claims 20 to 23, inclusive, in which the auxiliary support means includes an upper auxiliary support (132) comprising a plurality of circumferentially spaced ribs (140) connected to and protruding outwardly from the core barrel (14) and complementary slots (142) provided in and opening out of a radially inner surface of the upper support ring (72) within which slots (142) end portions of the ribs (140) are receivable with clearance.

25. A method of supporting a vessel in the form of a core barrel (14) of a high temperature gas cooled nuclear reactor (10, 200) which is housed within a reactor pressure vessel (12), the core barrel (14) being generally cylindrical in shape and having an axis which extends generally vertically, the method being characterised in that it includes

transmitting the weight of the core barrel (14) and its contents to the reactor pressure vessel (12) through a single vertical support (16); and

transmitting lateral loads between the core barrel (14) and the reactor pressure vessel (12) through a lateral support (18) which is positioned at or adjacent an upper end of the core barrel (14) and which includes a plurality of circumferentially spaced upper lateral supports (76) each of which includes a set of inner and outer lateral support members (78, 80) connected to the core barrel (14) and the reactor pressure vessel (12), respectively, and a roller element (86) sandwiched between the inner and outer upper lateral support members (78, 80).

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